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SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE
Sixth session
Bonn, 28 July - 5 August 1997

REPORT OF THE SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE ON THE WORK OF ITS SIXTH SESSION, BONN, 28 JULY - 5 AUGUST 1997

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I. OPENING OF THE SESSION
(Agenda item 1)

1. The sixth session of the Subsidiary Body for Scientific and Technological Advice (SBSTA) was held at the Hotel Maritim, Bonn, from 28 July to 5 August 1997.

2. The Chairman of the SBSTA, Mr. Tibor Faragó, opened the session on 28 July 1997. He welcomed all delegates as well as observers from non-Parties, United Nations bodies and organizations, and intergovernmental and non-governmental organizations and wished the participants a successful session.

3. The Executive Secretary welcomed the participants, in particular the new Parties to the Convention, provided information on the preparation for the sessions, and reviewed the planning for the third session of the Conference of the Parties (COP 3). He urged that each subsidiary body at that and the subsequent session should, to the extent possible, aim at producing draft decisions recommended by it for adoption by the COP without further discussion. He urged the SBSTA and the Subsidiary Body for Implementation (SBI) to minimize requests for new documentation for their October sessions.

4. The Executive Secretary expressed concern at the pace of submission of national communications, noting that only six Annex I Parties had met the deadline, and that hitherto, only half of the communications due, had been received. Also, two communications had been received from non-Annex I Parties. He recalled that communications were the basic commitment of all Parties and that their lack would inhibit the ability of the Parties to assess the need for future action to advance implementation and to strengthen the Convention.

II. ORGANIZATIONAL MATTERS
(Agenda item 2)

A. Adoption of the agenda
(Agenda item 2 (a))

5. At its 1st meeting, on 28 July 1997, the SBSTA considered the provisional agenda contained in document FCCC/SBSTA/1997/5.

6. Statements were made by representatives of 3 Parties.

7. At its 1st meeting, on 28 July, the SBSTA adopted the following agenda, in which the former agenda item 9 (Methodological issues related to joint implementation) was shifted to become a sub-item under agenda item 4.

1. Opening of the session.

2. Organizational matters:

   (a) Adoption of the agenda;

   (b) Election of officers other than the Chairman;

   (c) Organization of the work of the session;

   (d) Preparation by the SBSTA for the third session of the Conference of the Parties (COP 3);

3. Division of labour between the SBSTA and the Subsidiary Body for Implementation (SBI).

4. Methodological issues.

   (a) Programme of work;

   (b) Methodological issues related to joint implementation.

5. Cooperation with relevant international organizations.

6. National communications:

   (a) Communications from Parties included in Annex I to the Convention;

   (b) Communications from Parties not included in Annex I to the Convention.

7. Development and transfer of technologies.

8. Activities implemented jointly under the pilot phase.

9. Report on the session

B. Election of officers other than the Chairman
(Agenda item 2 (b))

8. At its 1st meeting, on 28 July, the SBSTA considered the sub-item on the election of officers other than the Chairman.

9. At the same meeting, the Chairman informed the SBSTA of the informal consultations with the representatives of regional groups during the sixth session of the Ad Hoc Group on the Berlin Mandate (AGBM) and of the agreement reached on the election of officers other than the Chairman (see FCCC/SBSTA/1997/4, para. 11). Subsequently, the SBSTA elected, by acclamation, Mr. S. Sok Appadu (Mauritius) and Mr. Alvaro J. Rodriguez (Colombia) as Vice-Chairman and Rapporteur respectively.

C. Organization of the work of the session
(Agenda item 2 (c))

10. At its 1st meeting, on 28 July, the SBSTA considered the sub-item on the organization of the work of the session.

11. The Chairman recalled that services for formal meetings with interpretation would be available in the morning, from 10 a.m. to 1 p.m., and in the afternoon, from 3 p.m. to 6 p.m. on 28 and 30 July, and in the afternoon only on 5 August 1997.

12. The Chairman reminded the SBSTA that the Bureau of the Conference of the Parties (COP) had decided previously to continue its policy of allowing representatives of non-governmental organizations access to the conference room floor before and after, but not during the meetings.

13. The Chairman informed the SBSTA that it was his intention, as during the previous session of the SBSTA, to invoke the flexibility accorded by the Bureau of the COP to the Chairman of each subsidiary body to grant representatives of non-governmental organizations access to the floor, as observers.

14. The Chairman also informed the SBSTA that the applications of two intergovernmental and 10 non-governmental organizations had been screened by the secretariat on the basis of the provisions of Article 7.6 of the Convention and in accordance with the procedures established by the COP for the admission of organizations as observers. The SBSTA agreed to grant access to these organizations for its sessions, pending formal action on their accreditation by the COP at its third session. These organizations are marked with an asterisk in the list of participants (FCCC/1997/INF.3).

15. A meeting of the Joint Working Group (JWG) of officers of the SBSTA and the Intergovernmental Panel on Climate Change (IPCC) was planned for 29 July 1997. In view

of this meeting and on a proposal by the Chairman, it was agreed to consider item 5 of the agenda on co-operation with relevant international organizations on Wednesday, 30 July 1997. It was further agreed that, in exchange, agenda item 8 on activities implemented jointly be considered on Monday, 28 July 1997.

D. Preparation by the SBSTA for the third session of the Conference of the Parties (COP 3)

(Agenda item 2 (d))

16. The Chairman reiterated the need that the SBSTA should prepare at the sixth and seventh sessions, recommendations on the issues on the SBSTA agenda that the COP would need to address at its third session. He hoped, in particular, that the SBSTA, in co-operation with the SBI, could already at that session agree on a draft decision regarding the division of labour between both bodies.

E. Attendance

17. The lists of attendance at the sixth session of the SBSTA is given in document FCCC/1997/INF.3.

F. Documentation

18. The documents prepared for the sixth session of the SBSTA, as well as other documents which were made available, are listed in the annex of the present document.

III. DIVISION OF LABOUR BETWEEN THE SBSTA AND THE SUBSIDIARY BODY FOR IMPLEMENTATION (SBI)

(Agenda item 3)

1. Proceedings

19. At its 1st meeting, on 28 July, the SBSTA considered the item on the division of labour between the SBSTA and the SBI on the basis of a proposal from the Chairmen of the SBSTA and the SBI (FCCC/SB/1997/2).

20. On a proposal of its Chairman, endorsed by the Chairman of the SBI, the SBSTA set up an informal contact group to conduct consultations on the division of labour between the two bodies. This group was invited to prepare draft conclusions on the division of labour for adoption by the SBSTA and the SBI, including a recommendation for a draft decision for adoption by the COP at its third session.

21. Statements were made by representatives of 12 Parties, including one speaking on behalf of the European Community and its member States.

2. Conclusion

22. At its 5th meeting, on 5 August, having considered a proposal by the Chairman, the SBSTA adopted the following conclusion:

(a) At their sixth sessions, the SBSTA and the SBI both decided to recommend a draft decision for adoption by the COP at its third session. The text of this decision is included in annex III of the report of the sixth session of the SBI (FCCC/SBI/1997/16).

IV. METHODOLOGICAL ISSUES
(Agenda item 4)

A. Programme of work
(Agenda item 4 (a))

1. Proceedings

23. At its 1st meeting, on 28 July 1997, the following documents relating to methodologies were presented by the secretariat, namely FCCC/SB/1997/INF.2, FCCC/SBI/1997/10 and FCCC/SBI/1997/INF.1. Having considered a proposal made by the Chairman, the SBSTA established an informal consultative group under the Co-Chairmanship of the Vice-Chairman of the SBSTA and a delegate. The group met on five occasions and considered priorities on methodological issues, including the implications for the biennium budget of the United Nations Framework Convention on Climate Change (UNFCCC).

24. At the 1st meeting of the SBSTA, statements were made by representatives of 8 Parties, including one speaking on behalf of the European Community and its member States and another speaking on behalf of the Group of 77 and China.

25. At its 4th meeting, on 30 July, the SBSTA examined the report of the informal group. Twelve Parties expressed their views, including one speaking on behalf of the Group of 77 and China.

26. On a proposal by the Chairman, the SBSTA invited the group to further elaborate its report, taking into account the views expressed, and further comments from Parties, and report back to the SBSTA.

2. Conclusions

27. On the basis of the work of the group, and upon the proposal of the Chairman, the SBSTA, at its fifth meeting on 5 August, adopted the following conclusions:

28. Regarding the work of other international organizations, the SBSTA:

(a) Welcomed the plans of the IPCC to assess methodologies in the literature that are relevant to all the clusters identified in the work programme, namely those relating to inventories, projection, mitigation, impacts and adaptation, and socio-economic cost-benefit analysis, as part of the Third Assessment Report (TAR). It also noted that such information could contribute to the work of other international organizations, the SBSTA, and other bodies of the Convention;

(b) Noted with appreciation the close collaboration between the IPCC and the secretariat, particularly in the work on inventories of greenhouse gas emissions (GHGs), and strongly supported the future work programme of the IPCC, the Organization for Economic Co-operation and Development (OECD) and the International Energy Agency (OECD/IEA) on this topic. Regarding the work on inventories, it requested the IPCC/OECD/IEA programme to consider accelerating its task on uncertainties, so that the results could be taken into consideration by the SBSTA;

(c) Noted and strongly supported the work programmes identified in FCCC/SB/1997/INF.2 as conducted by other international organizations, in particular the work undertaken by the United Nations Enviornment Programme, Collaborating Centre on Environment and Energy at Riso (UNEP/RISO) in Denmark on assessing mitigation measures and policies, the United Nations Industrial Development Organization (UNIDO) on methods for assessing industrial mitigation technologies and UNEP on methods for assessing impacts of climate change; and

(d) Invited the above international organizations to continue to provide information on their work to the SBSTA.

29. Regarding the work programme to be conducted by the secretariat in the next biennium, the SBSTA:

(a) Decided that the highest priority should be given to activities related to the application of the methods for GHG inventories and that high priority be given to projections of GHG emissions and sinks; and

(b) Decided that priority should also be given to methods for evaluating and monitoring the effectiveness and effects of specific policies and measures and for assessing adaptation strategies and technologies.

30. On the basis of the above, the SBSTA urged the SBI to give consideration to the indicative budget, reflecting priorities for methodological work, proposed in the following table in establishing a UNFCCC budget for the next biennium.

TABLE: INDICATIVE BUDGET FOR THE METHODOLOGICAL WORK PROGRAMME OF THE UNFCCC

Methodological Activity (Cluster/task)	Resources recommended by the SBSTA for the programme budget 1998-1999 1000 $US/work years
A. Inventorying GHG emissions and sinks	873 6.0
B. Projections of GHG emissions and sinks	333 2.0
C. Mitigation	
Evaluating and monitoring the effectiveness and effects of specific policies and measures	135 1.0
D. Impacts and adaptation	
Assessing adaptation strategies and technologies	135 1.0
Experts from non-Annex I Parties	90
Total resources (including costs of work years)	1566* 10.0

*This amount includes estimates for consultants (134,000 $US in 1998, 134,000 $US in 1999) and travel (52,000 $US in 1998, 57,000 $US in 1999)

31. The SBSTA urged the secretariat, in carrying out the work programme on methodologies, to co-operate closely with the IPCC and other international organizations.

32. The SBSTA noted the important need to ensure the participation of experts from Parties, in particular non-Annex I Parties, bearing in mind the need for relevant regional balance and examples given in Article 4.8 of the Convention. It noted that the Trust Fund for supplementary activities could be utilized to support the participation of additional experts from eligible Parties. It urged Parties to provide adequate funding for these activities.

33. The SBSTA requested the secretariat to report on progress on its work programme on methodologies.

34. At the next session, the SBSTA will begin consideration of appropriate ways to provide terms of reference of expert contributions and the review of technical documents to be produced, in accordance with the work programme on methodologies.

35. The SBSTA requested Parties to provide initial comments by January 20, 1998 to the secretariat, on the priority areas and options for work on projections, for compilation into a miscellaneous document, to be considered at the eighth session of the SBSTA.

B. Methodological issues related to joint implementation
(Agenda item 4 (b))

1. Proceedings

36. At its 2nd and 5th meetings on 28 July and 5 August, respectively, the SBSTA considered the sub-item on methodological issues related to joint implementation. It had before it document FCCC/SBSTA/1997/INF.2. Following the expression of various views, the SBSTA concluded to defer this issue for consideration at a future session.

37. Statement were made by representatives of 11 Parties, including one speaking on behalf of the European Community and its member States and another speaking on behalf of the Group of 77 and China.

V. CO-OPERATION WITH RELEVANT INTERNATIONAL ORGANIZATIONS
(Agenda item 5)

1. Proceedings

38. At its 3rd meeting, on 30 July, the SBSTA considered the item on co-operation with relevant international organizations. It had before it document FCCC/SBSTA/1997/MISC.4.

39. Statements were made by representatives of the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC/UNESCO), the Scientific and Technical Advisory Panel of the Global Environment Facility (GEF/STAP), the World Meteorological Organization (WMO), and UNEP.

40. The Chairman of the SBSTA provided a report on the meeting of the JWG of officers of the UNFCCC and the IPCC, which took place on 29 July 1997.

41. The Chairman and the Chairman-elect of the IPCC made statements and also responded to questions.

42. Statements were made by representatives of 13 Parties, including one speaking on behalf of the European Community and its member States and another speaking on behalf of the Group of 77 and China.

43. Statements were also made by the representatives of the IPCC, the IOC of UNESCO, GEF, WMO and UNEP.

2. Conclusions

44. At its 3rd meeting, on 30 July, in response to the above mentioned statements, and upon the proposal of the Chairman, the SBSTA:

(a) Noted with appreciation the information provided by IOC/UNESCO, GEF/STAP, WMO and UNEP on the progress of programmes carried out by their respective organizations and other organizations involved in the climate agenda;

(b) Also noted with appreciation the information provided by the Chairman and the Chairman-elect of the IPCC, particularly regarding the TAR, and noted with satisfaction the regional emphasis and the further involvement of experts from developing countries. It invited Parties to submit additional information on key policy issues, particularly regarding the synthesis report, to the secretariat before 20 January 1998, to be compiled into a miscellaneous document;

(c) Requested the secretariat to organize, together with the IPCC, an informal meeting at the next session of the SBSTA to discuss key issues to be addressed in the TAR;

45. The SBSTA called upon Parties to work through other relevant organizations, including the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO), to address climate change issues in their deliberations and requested these organizations to provide reports on their work to future sessions of the SBSTA;

46. The SBSTA further requested the above mentioned organizations to continue their valuable work in support of the Convention process.

VI. NATIONAL COMMUNICATIONS
(Agenda item 6)

A. Communications from Parties included in Annex I to the Convention
(Agenda item 6 (a))

1. Proceedings

47. At its 2nd and 5th meetings, on 28 July and 5 August, respectively, the SBSTA considered the sub-item on communications from Parties included in Annex I to the Convention. It had before it documents presented by the secretariat FCCC/SB/1997/5, FCCC/SB/1997/6 and FCCC/SB/1997/INF.3.

48. An informal workshop on updated information from the national communication of Annex I Parties was organized during the sixth session of the SBI. The report on the outcome of this workshop contained, *inter alia*, references to methodological issues.

49. A statement was made by the representative of a Party.

2. Conclusions

50. The SBSTA took note of the documents prepared by the secretariat under this agenda sub-item and endorsed the proposal from the Chairman that these documents were to be considered by the SBI, in accordance with the proposed division of labour between the SBSTA and the SBI.

51. The SBSTA also took note of the methodological issues outlined in the report on the informal workshop on Annex I communications, referred to in paragraph 48 above.

B. Communications from Parties not included in Annex I to the Convention
(Agenda item 6 (b))

1. Proceedings

52. At its 2nd and 5th meetings, on 28 July and 5 August, respectively, the SBSTA considered the sub-item on communications from Parties not included in Annex I to the Convention. It based its discussion on documents FCCC/SBI/1997/9 and FCC/SBI/1997/13 presented by the secretariat. The SBSTA decided to refer this sub-item to the SBI for its consideration.

53. A statement was made by the representative of a Party.

2. Conclusion

54. The SBSTA took note of the conclusions of the SBI on communications from Parties not included in Annex I to the Convention as provided for in the report of the sixth session of the SBI under item 4 (b).

VII. DEVELOPMENT AND TRANSFER OF TECHNOLOGIES
(Agenda item 7)

1. Proceedings

55. At its 3rd and 4th meetings, on 30 July, respectively, the SBSTA considered the item on development and transfer of technologies. It based its discussion on three documents presented by the secretariat, FCCC/SB/1997/3, FCCC/SB/1997/4 and FCCC/TP/1997/1.

56. Statements were made by representatives of 12 Parties, including one speaking on behalf of the European Community and its member States, one speaking on behalf of the Group of 77 and China and another speaking on behalf of the African Group.

2. Conclusions

57. At its 5th meeting, on 5 August, upon the recommendation by the Chairman, the SBSTA agreed to the following conclusions.

58. The SBSTA took note with appreciation of the progress reports presented by the secretariat, and the technical report with information on trends of financial flows and terms and conditions employed by multilateral lending institutions.

59. The SBSTA also expressed appreciation for the information on adaptation technology and information centers and networks, and encouraged the secretariat to complete the reports on these subjects for its next session.

60. The SBSTA supported the secretariat's plans to prepare reports on the role of the private sector, and on barriers and enabling activities of governments related to the transfer of technology.

61. The SBSTA encouraged the secretariat to extend its co-operation with other organizations such as the World Bank and the OECD, with the aim of, *inter alia*, improving the availability of climate relevant data. In this context, it noted that the Development Assistance Committee (DAC) of the OECD is co-operating with the United Nations Convention on Biological Diversity (UNCBD) in order to introduce a specific biodiversity "marker" in their statistics, and considered the need for similar information regarding climate change projects.

62. The SBSTA discussed the subject of intergovernmental technical advisory panels (ITAPs). It noted that the secretariat had been requested to prepare a report on its experience in using the roster of experts. It recalled that the subject of ITAPs, including their possible establishment, would be considered by the SBSTA at its seventh session and requested Parties to send any new ideas on ITAPs to the secretariat by 31 August 1997.

63. The SBSTA welcomed that the secretariat had made use of the roster in three expert meetings on technology and technology transfer issues and recalled its request to Parties which have not yet done so, to nominate experts for the roster, bearing in mind the need for experts with a background in economic and financial aspects of the transfer of technology.

VIII. ACTIVITIES IMPLEMENTED JOINTLY UNDER THE PILOT PHASE
(Agenda item 8)

1. Proceedings

64. At its 2nd meeting, on 28 July, the SBSTA considered the item on activities implemented jointly under the pilot phase, on the basis of document FCCC/SBSTA/1997/INF.2 presented by the secretariat .

65. Statements were made by representatives of 15 Parties, including one speaking on behalf of the European Community and its member States.

2. Conclusion

66. The SBSTA took note with appreciation of the information on activities implemented jointly contained in the abovementioned document and of the ongoing work of the secretariat in this field.

IX. REPORT ON THE SESSION
(Agenda item 9)

67. At its 5th meeting, on 5 August, the SBSTA authorized the Rapporteur, under the guidance of the Chairman and with the assistance of the secretariat, to complete the report taking into account the discussions of the Group and the need for editorial adjustments.

68. The chairman, after thanking all participants for their constructive co-operation, declared the sixth session of the SBSTA closed.

DOCUMENTS BEFORE THE SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE AT ITS SIXTH SESSION

Documents prepared for the session

FCCC/SBSTA/1997/5	Provisional agenda and annotations.
FCCC/SBSTA/1997/MISC.4	Co-operation with relevant international organizations: Structure and content of the Third Assessment Report by the IPCC. Comments by Parties.
FCCC/SBSTA/1997/INF.2	Activities implemented jointly under the pilot phase.
FCCC/SB/1997/2	Division of labour between the subsidiary bodies established by the Convention: Note by the Chairman.
FCCC/SB/1997/3	Development and transfer of technologies: Progress report.
FCCC/SB/1997/4	Development and transfer of technologies: Update to progress report.
FCCC/SB/1997/5	National communications from Parties included in Annex I to the Convention.
FCCC/SB/1997/6	Communications from Parties included in Annex I to the Convention: Inventory and projection data.
FCCC/SB/1997/INF.2	Programme of work on methodologies.
FCCC/SB/1997/INF.3	Status report on the review of first national communications from Annex I Parties and the submission of second communications.
FCCC/TP/1997/1	Development and transfer of technologies: Trends of transfer of technology and know-how. Trends and basic data on financial flows to developing countries.
FCCC/SBSTA/1997/L.2	National Communications: Communications from Parties included in Annex I to the Convention.

FCCC/SBSTA/1997/L.3	Activities implemented jointly under the pilot phase.
FCCC/SBSTA/1997/L.4	Draft report of the Subsidiary Body for Scientific Technological Advice on the work of its sixth session, Bonn, 28 July - 5 August 1997.
FCCC/SBI/1997/L.2	Draft report of the Subsidiary Body of Implementation on the work of its sixth session, Bonn, 28 July - 5 August 1997.

Other documents for the session

FCCC/SBSTA/1997/4	Report of the Subsidiary Body for Scientific and Technological Advice on the work of its fifth session, Bonn, 25-28 February 1997.
FCCC/SBSTA/1996/20	Report of the Subsidiary Body for Scientific and Technological Advice on the work of its fourth session, Geneva, 16-18 December 1996.
FCCC/SBI/1997/9 Annex I	Communications from Parties not included in to the Convention: Secretariat activities to facilitate the provision of financial and technical support. Progress report.
FCCC/SBI/1997/10	Programme Budget of the Convention for the Biennium 1998-1999.
FCCC/SBI/1997/13	Communications from Parties not included in Annex I to the Convention: Information on the submissions of initial national communications.
FCCC/SB/1997/1	Progress report on technology and technology transfer.
FCCC/CP/1995/7 and Add.1	Report of the Conference of the Parties on its first session, held at Berlin from 28 March to 7 April 1995.

FCCC/CP/1996/15 and Add.1	Report of the Conference of the Parties on its second session, held at Geneva from 8 to 19 July 1996.
A/AC.237/91/Add.1	Report of the intergovernmental negotiating committee for a Framework Convention on Climate Change on the work of its eleventh session held at New York from 6 to 17 February 1995. Part two: Recommendations to the Conference of the Parties and other decisions and conclusions of the committee.

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Seventh Session
Bonn, 20-29 October 1997
Item 2 (a) of the provisional agenda

PROVISIONAL AGENDA AND ANNOTATIONS

Note by the Executive Secretary

I. INTRODUCTION

1. Arrangements have been made for the seventh session of the Subsidiary Body for Scientific and Technological Advice (SBSTA), to be held at the Beethovenhalle, Bonn, from 20 to 29 October 1997. The session will be opened by the Chairman at 3 p.m. on Monday, 20 October 1997.

II. PROVISIONAL AGENDA

2. The provisional agenda for the seventh session of the SBSTA, proposed after consultation with the Chairman, is as follows:

1. Opening of the session.

2. Organizational matters:

   (a) Adoption of the agenda;
   (b) Organization of the work of the session;
   (c) Preparations by the SBSTA for the third session of the Conference of the Parties (COP 3).

3. Co-operation with relevant international organizations.

4. National communications:

   (a) Communications from Parties included in Annex I to the Convention;
   (b) Communications from Parties not included in Annex I to the Convention.

5. Methodological issues.

6. Development and transfer of technologies:

   (a) Programme of work;
   (b) Activities by Annex II Parties regarding the transfer of technologies.

7. Roster of experts.

8. Activities implemented jointly under the pilot phase.

9. Report on the session.

III. ANNOTATIONS TO THE PROVISIONAL AGENDA

1. Opening of the session

3. The seventh session of the SBSTA will be opened by the Chairman at 3 p.m. on Monday, 20 October 1997.

2. Organizational matters

(a) Adoption of the agenda

4. The provisional agenda for the seventh session of the SBSTA is presented for adoption (see paragraph 2 above).

(b) Organization of the work of the session

(i) Co-ordination with the Subsidiary Body for Implementation (SBI)

5. The SBSTA will need to prepare at its seventh session its recommendations to the third session of the Conference of the Parties (COP 3) on some matters before it. The SBSTA may wish to continue following the approach it had taken at its sixth session.

6. The provisional agenda and annotations reflect the recommendations on the division of labour between the SBSTA and the Subsidiary Body for Implementation (SBI) that were adopted by both bodies at their sixth sessions. At their seventh sessions, several agenda items are common to both. This is, *inter alia*, a reflection of the need for the SBI to assist the COP in its reviews on the effective implementation of the Convention. Several ways exist to ensure
co-ordination on such issues between the subsidiary bodies. For example, ad-hoc joint sessions could be held. Alternatively, one body may request the other to handle the issue on its behalf, in order to ensure an integral consideration. Another option is that one body may take overall responsibility in considering an issue, requesting adequate and specific inputs from the other body. Or finally, informal joint drafting groups could be established.

7. The Chairman of the SBSTA and the SBI may make proposals on the organization of work of such common items, for consideration by the bodies.

(ii) Documentation

8. The provisional agenda has been drawn up taking account of the expected timely availability of documentation in the six languages of the United Nations. There are some exceptions as indicated below.

9. Documents FCCC/SBSTA/1997/10, FCCC/SBSTA/1997/12, FCCC/SBSTA/1997/12/Add.1, FCCC/SBSTA/1997/13, FCCC/SBSTA/1997/INF.4 and FCCC/SBSTA/1997/MISC.6 may be available late.

10. A list of documents relating to the provisional agenda, as well as other documents available at the session, is contained in annex I to this document.

(iii) Schedule

11. The scheduling of meetings for the session will be based on the availability of facilities
during normal working hours, when services are available for meetings with interpretation from 10 a.m. to 1 p.m. and 3 p.m. to 6 p.m. There will also be some facilities for informal meetings, some of which may have interpretation. Delegations are urged to use these facilities fully by attending all meetings promptly at the scheduled time. A suggested approach to the organization of work is contained in annex II to this document.

3. Co-operation with relevant international organizations

12. At its fourth session, the SBSTA requested the secretariat to explore ways to enhance co-ordination on relevant methodological activities, for example, on the monitoring of greenhouse gases in the atmosphere with the World Meteorological Organization (WMO), and to advise the SBSTA on these activities. In response to this request, the secretariat has

developed a note, on the basis of a report by WMO, for consideration by the SBSTA (FCCC/SBSTA/1997/8).

13. At its fifth session, the SBSTA requested the co-sponsors of the Conference on the World Climate Research Programme (WCRP), to be held at Geneva from 26 to 28 August 1997, to make a full report of the Conference available to it. The WMO will provide this report (FCCC/SBSTA/1997/MISC.6).

14. The SBSTA may also receive short oral reports from relevant international organizations, on the progress of work related to the Convention.

15. At its sixth session, the SBSTA, requested the secretariat to organize, together with the
Intergovernmental Panel on Climate Change (IPCC), an informal meeting at the seventh session of the SBSTA, to discuss key issues to be addressed in the Third Assessment Report (TAR). This meeting is tentatively scheduled for the afternoon of Thursday, 23 October 1997.

4. National communications

(a) Communications from Parties included in Annex I to the Convention

16. At its seventh session, the SBI will consider the first compilation and synthesis report of second national communications of Annex I Parties. It will also consider updated information on greenhouse gas emissions and projections drawn from the first and second national communications, as well as other information relevant to national communications of

Annex I Parties (see FCCC/SBI/1997/17, paras. 12-19). Related to this, and taking into account the division of labour, the SBSTA may consider methodological issues, in particular those related to the submission of inventory data. (FCCC/SBI/1997/19 and Add.1, FCCC/SBI/1997/INF.4 and FCCC/SB/1997/6). The SBSTA may in particular consider to give further guidance on any additional information to be submitted with the inventory tables. The SBSTA may also provide advice, within its mandate, on aspects of the communications relating to the development and transfer of technology (see paragraphs 21-23 below).

(b) Communications from Parties not included in Annex I to the Convention

17. At its second session, by its decision 10/CP.2, paragraph 1(a), the COP requested the secretariat, in accordance with Article 8.2 (C) to facilitate assistance to Parties, particularly developing country Parties, in the preparation of their initial communications, through the organization of workshops at the regional level; to provide a forum for the exchange of experiences in the development of emission factors and activity data for the preparation of the inventory, as well as, on request, for other elements of information in the initial

communication; and to provide a report to the SBSTA and the SBI at each of their sessions (FCCC/CP/1996/15/Add.1).

18. In view of the proposed division of labour, and since there are no methodological issues to be addressed at this session, the SBSTA does not need to consider this agenda item. Instead, it will be discussed by the SBI.

5. Methodological issues

19. At its fourth session, the SBSTA requested the secretariat to compile and synthesize information on emissions as affected by weather and electricity trade, as well as the methodologies used for adjustments, from the national communications and the in-depth reviews. The SBSTA will have before it a paper on methodological issues FCCC/SBSTA/1997/9 and a technical paper on how emission estimates are affected by temperature adjustment (TP/1997/2). The SBSTA may wish to consider this information with a view to giving guidance to Parties and the secretariat on how to deal with temperature adjustments to inventory data.

20. At its sixth session, the SBSTA decided to give consideration to the appropriate ways to provide terms of reference for expert contributions and the review of technical documents to be produced, in accordance with the work programme on methodologies. Parties may wish to come prepared with possible suggestions about approaches to this issue.

6. Development and transfer of technologies

(a) Programme of work

21. At its sixth session, the SBSTA took note of activities underway by the secretariat to prepare reports on topics such as adaptation technologies, technology information centres and networks and technology transfer activities supported by Annex II Parties. It urged the secretariat to complete the reports on these subjects for the next session.

22. The SBSTA will have before it a progress report on development and transfer of technology FCCC/SBSTA/1997/10 and an overview of the information provided on technology transfer activities by Annex II Parties (FCCC/SBSTA/1997/13). It will also have available a technical paper (TP/1997/3) which will provide an overview of adaptation technologies and a note (FCCC/SBSTA/1997/INF.4) on options for technology information centres and information.

23. The SBSTA may take note of the above reports and the progress made in the areas of

technology development and the transfer of technologies during the past year, and in conjunction with the SBI, develop a recommendation for a draft decision by the COP on these matters
(see FCCC/SBI/1997/17, paras. 31-33). In relation to this, it may consider the proposal by a Party for a decision by COP 3 contained in FCCC/SBSTA/1997/INF.5.

7. Roster of experts

24. At its second session, the COP, in its decision 7/CP.2, noted that the roster of experts and
its use in facilitating the work of the Convention secretariat should be evaluated by the SBSTA and the SBI, taking into account the ongoing discussion on Intergovernmental Technical Advisory Panel(s) (ITAPs).

25. At its fifth session, the SBSTA requested the secretariat to produce a report for its seventh session on its experience in using the roster of experts. Accordingly, a report has been prepared describing the roster and its use, FCCC/SBSTA/1997/11. A list of experts on the roster is available in document FCCC/SBSTA/1997/INF.6.

26. The SBSTA may wish to provide further guidance regarding the roster, and develop a recommendation for a decision by the COP on the roster of experts, and, keeping in mind the proposed division of labour with the SBI, inform the SBI accordingly.

27. At its sixth session, the SBSTA considered the subject of ITAPs. It recalled that the subject of ITAPs, including their possible establishment, would be considered by the SBSTA at its seventh session and requested Parties to send any new ideas on the subject to the secretariat by 31 August 1997. Parties may wish to note that, in response to decision 6/CP.1, the SBSTA previously considered the issue of ITAPs at its first and second sessions (FCCC/SBSTA/1995/2, FCCC/SBSTA/1995/3, FCCC/SBSTA/1996/2, FCCC/SBSTA/1996/3, and FCCC/SBSTA/1996/MISC.3). If consensus can be reached regarding ITAPs, the SBSTA may wish to develop a recommendation for a draft decision by COP 3 on this matter.

8. Activities implemented jointly under the pilot phase

28. The COP in its decision 5/CP.1, requested the SBSTA and the SBI, with the assistance

of the secretariat, to prepare a synthesis report for consideration by the COP.

29. The SBSTA will have before it, for consideration, document FCCC/SBSTA/1997/12 and
its addendum providing a synthesis prepared by the secretariat on the basis of reports on activities implemented jointly, submitted by Parties, in accordance with the initial framework

for reporting and the uniform reporting format, before 30 June 1997. It further provides an overview of the progress made since the last session of the COP.

30. The SBSTA may wish to prepare conclusions on technical aspects on the basis of its consideration of these documents. These conclusions will assist the SBI in preparing a recommendation to the COP on the continuation of the pilot phase as well as on the need for a comprehensive review.

31. At its fifth session, the SBSTA requested the secretariat to develop, in accordance with decision 5/CP.1, practical options with regard to the list of methodological issues contained in paragraph 47(d) of its report on the work of that session (FCCC/SBSTA/1997/4) and to report on the progress made in this respect. The SBSTA invited interested Parties and organizations to provide support to the secretariat in this task.

32. The secretariat has started the process of developing practical options and will provide a brief oral report. The SBSTA will have before it, for information, document FCCC/SBSTA/1997/INF.3 providing an update on activities implemented jointly under the pilot phase. The SBSTA may take note of that information.

9. Report on the session

33. Due to the relatively short duration of the session and the number of items on its agenda,
a complete draft text of the report might not be available at the end of the session. The SBSTA may wish to adopt decisions or texts of substantive conclusions, and authorize the Rapporteur to complete the report after the session with the guidance of the Chairman and the assistance of the secretariat. Subject to the availability of sufficient time for their translation, conclusions will be made available in all languages.

Annex I

DOCUMENTS BEFORE THE SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE AT ITS SEVENTH SESSION

Documents prepared for the session

FCCC/SBSTA/1997/7	Provisional agenda and annotations.
FCCC/SBSTA/1997/8	Cooperation with relevant international organizations: Monitoring of greenhouse gases in the atmosphere
FCCC/SBSTA/1997/9	Methodical issues: Progress report
FCCC/SBSTA/1997/10	Development and transfer of technologies: Progress report
FCCC/SBSTA/1997/11	Roster of experts: Experience of the secretariat in its use
FCCC/SBSTA/1997/12	Synthesis report on activities implemented jointly under the pilot phase
FCCC/SBSTA/1997/12/Add.1	Synthesis report on activities implemented jointly under the pilot phase: Addendum
FCCC/SBSTA/1997/13	Second communications from Parties included in Annex I to the Convention. Activities of Parties included in Annex II related to transfer of technology
FCCC/SBSTA/1997/INF.3	Activities implemented jointly under the pilot phase
FCCC/SBSTA/1997/INF.4	Options for technological information centres and networks
FCCC/SBSTA/1997/INF.5	Development and transfer of technologies: Proposal from a Party: Draft decision regarding the transfer of technologies

FCCC/SBSTA/1997/INF.6	Roster of experts: Nominations to the roster
FCCC/SBSTA/1997/MISC.6	Report on World Climate Research Programme. Report of the Conference on the WCRP.
FCCC/SBSTA/1997/MISC.7	Submissions on Intergovernmental Technical Advisory Panel(s) (ITAPs)

Other documents for the session

FCCC/CP/1995/7/Add.1	Report of the Conference of the Parties on its first session, held at Berlin from 28 March to 7 April 1995. Part two.
FCCC/CP/1996/15/Add.1	Report of the Conference of the Parties on its second session, held at Geneva from 8 to 19 July 1996. Part two.
FCCC/SBSTA/1995/2	Proposed programme of work.
FCCC/SBSTA/1995/3	Report of the Subsidiary Body for Scientific and Technological Advice on the work of its first session held at Geneva from 28 August to 1 September 1995
FCCC/SBSTA/1996/2	Establishment of Intergovernmental Technical Advisory Panel(s).
FCCC/SBSTA/1996/3	Communications from Parties included in Annex I to the Convention: Report on the guidelines for the preparation of first communications by Annex I Parties.
FCCC/SBSTA/1996/MISC.3	Establishment of Intergovernmental Technical Advisory Panel(s): Comments from Parties, positions of the Group of 77 and China, and of the United States of America.
FCCC/SBSTA/1997/4	Report of the Subsidiary Body for Scientific and Technological Advice on the work of its fifth session, Bonn, 25-28 February 1997.
FCCC/SBSTA/1997/6	Report of the Subsidiary Body for Scientific and Technological Advice on the work of its sixth session, Bonn, 28 July - 5 August 1997.

FCCC/SBI/1997/17	Report of the Subsidiary Body for Implementation on the work of its sixth session, Bonn, 28 July - 5 August 1997.
FCCC/SBI/1997/19	Communications from parties included in Annex I to the Convention: First compilation and synthesis of second communications
FCCC/SBI/1997/19/Add.1	Communications from Parties included in Annex I to the convention: First compilation and synthesis of second communications, Addendum, Tables of inventories of anthropogenic emissions and removals and projections up to the year 2020
FCCC/SBI/1997/INF.4	Communications from Parties included in Annex I to the Convention. Updated information on greenhouse gas emissions and projections
FCCC/SB/1997/6	Communications from Parties included in Annex I to the Convention: Inventory and projection data.
FCCC/TP/1997/2	Methodological issues: Temperature adjustments
FCCC/TP/1997/3	Adaptation technologies

Annex II

PROPOSED SCHEDULE OF WORK FOR THE SEVENTH SESSION OF THE SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE

	Monday 20 October	Tuesday 21 October	Friday 24 October	Tuesday 28 October	Wednesday 29 October
10 a.m. to 1 p.m.			Item 5 Item 7		
3 p.m. to 6 p.m.	Item 1 Item 2 Item 4 (a) Item 4 (b)	Item 6 Item 8		Item 3	Item 9

Facilities for informal meetings of the SBSTA will be available in the morning on Tuesday 21 October and in the afternoon on Wednesday 22 October.

An informal meeting on the IPCC (TAR) is provisionally scheduled for Thursday, 23 October in the afternoon. The results can be reported to the plenary meeting in the morning of friday 24 October

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UNITED NATIONS

Framework Convention on Climate Change

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23 September 1997

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SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE
Seventh session
Bonn, 20-29 October 1997
Item 3 of the provisional agenda

CO-OPERATION WITH RELEVANT INTERNATIONAL ORGANIZATIONS

Monitoring of greenhouse gases in the atmosphere

Note by the secretariat

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I. INTRODUCTION

A. Mandate and scope of the note

1. At its fourth session, the Subsidiary Body for Scientific and Technological Advice (SBSTA) welcomed the efforts of the secretariat to encourage co-ordination of relevant methodological activities among international organizations, bodies of the United Nations and related conventions and requested the secretariat to further explore ways to enhance this co-ordination, for example, on the monitoring of greenhouse gases (GHGs) in the atmosphere with the World Meteorological Organization (WMO) and to advise the SBSTA on these activities (FCCC/SBSTA/1996/20, para. 42).

2. Further to this request, and in co-operation with the secretariat, WMO has prepared a progress report on the monitoring of GHGs in the atmosphere which is presented in the attached annex.

II. POSSIBLE ACTION BY THE SBSTA

3. The SBSTA may wish to:

(a) Take note of the information provided by WMO on the world-wide systematic observation of GHGs in the atmosphere within the Global Atmosphere Watch (GAW), which provides the basic information for scientific studies on the impacts of changes in atmospheric composition on the climate system, and, as such, for the assessments by the Intergovernmental Panel on Climate Change (IPCC);

(b) Express its appreciation to those Parties already operating stations within the existing network, as well as to the Global Environment Facility (GEF) for its support in the establishment and operation of several stations;

(c) Invite Parties and relevant funding organizations and programmes to provide financial and other support to strengthen and maintain the GAW; and

(d) Invite WMO to continue its efforts to implement the GAW and to report on progress to future sessions of the SBSTA.

Annex

THE GLOBAL ATMOSPHERE WATCH[1, 2]

A system for environmental monitoring and research

Introduction

The major responsibility for monitoring global changes in the atmospheric environment belongs to the World Meteorological Organization (WMO). The Organization coordinates the environmental monitoring activities and scientific assessments of its 178 Member states and 5 territories through its Global Atmosphere Watch (GAW), a system of networks of observing stations, related facilities, and infrastructure encompassing the measurement and related scientific assessment activities devoted to the investigation of the changing chemical composition and related physical characteristics of the global atmosphere. GAW serves as an early warning system to detect further changes in atmospheric concentrations of greenhouse gases, changes in the ozone layer and in the long-range transport of pollutants, including acidity and toxicity of precipitation as well as of atmospheric burden of aerosols (dirt and dust particles).

Background

GAW was established by the WMO Executive Council in June 1989 to strengthen and better co-ordinate WMO environmental data-gathering activities that began in the 1950s. It provides framework design, standards, intercalibrations and data collection systems for global monitoring and data evaluation. Through GAW, state-of-the-science measurements of a number of mostly low-concentration chemical and physical constituents of the atmosphere at levels extending from the surface to the stratosphere and at some of the most difficult locations on Earth are being made. Some three hundred stations now comprise the WMO GAW network (Figure 1). GAW has become broadly recognized, both by governments and within the scientific community at large, as an essential tool for monitoring the state and the evolution of the composition of the atmosphere and for improving the understanding of its interactions with all aspects of the environment.

Bearing in mind heightened public awareness and concerns for climate and environmental issues in general, activities associated with the further development and implementation of GAW continue to be prominent. In recent years, new stations have been added to the network and existing ones upgraded. Complementing this overall extension of the observing network are important supporting activities in areas such as education and training, and quality assurance and assessment procedures. In particular, the establishment of Quality Assurance/Science Activity Centres (QA/SACs), a number of World Calibration Centres (WCCs) and the increased number of WMO World Data Centres such as the WMO World Data

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[1] This document has been produced as received and is without formal editing

[2] For figures: see at the back of this document

Centre for Greenhouse Gases in Japan are seen as major steps forward for maintaining consistent and known data quality in the GAW Programme.

The Measurement of Greenhouse Gases

In 1956, long-term carbon dioxide measurements were begun at Mauna Loa Observatory in Hawaii, USA. Since that time three other gases were recognized as important greenhouse gases: nitrous oxide (N_2O), methane (CH_4), halocarbons (CFCs) and tropospheric ozone.

Carbon Dioxide Carbon dioxide data have been included in the WMO atmospheric monitoring programme in the 1960s and as early as 1975 WMO issued an authoritative assessment of the potential role of the CO_2 increase for climate. In the mid 1970s, the WMO Research and Monitoring Project on Atmospheric Carbon Dioxide was initiated whose objectives were to strengthen long-term monitoring for better trend determination, to predict its concentration through the next century, and to assess its possible effects on the climate. The monitoring aspects of CO_2 remain within WMO GAW whereas the other objectives have been further developed within the WMO World Climate Programme activities. In Figure 2, the long term record from four diverse locations show the global CO_2 increase.

To measure CO_2 an instrument called a non-dispersive infra-red analyser (NDIR) is more or less universally used. Numerous manufacturers make this instrument. It compares the absorption of infra-red radiation from a source in the instrument (sample) with the absorption of a known concentration of CO_2 (reference) in a specially prepared mixture of standard gases. The CO_2 concentration is determined from the relative analyser output between the sample gas and the reference gas. CO_2 concentration is also determined by collecting air in flasks and returning the flasks to a central laboratory where NDIR measurements are made. The network coordinated by the US National Oceanic and Atmospheric Administration is shown in Figure 3.

Methane CH_4 is emitted into the atmosphere from a variety of natural and anthropogenic sources such as natural wetlands, rice patties, fermentation processes in animals, biomass burning, natural gas production and landfills. While the major sources of atmospheric methane have been identified, the relative strength of each source is not yet clearly known. It can be seen in Figure 3 that methane is also measured at the locations along with CO_2. The most common method of measurement is by gas chromatography which can only be done at locations with high technical skills. The global distribution of methane is shown in Figure 4.

Nitrous Oxide N_2O is also an important greenhouse gas which has both natural and man-made sources. However these are poorly quantified. Determination of global concentrations is difficult since nitrous oxide, which is released mainly from soils, is very heterogeneous. It is estimated to contribute about 6% to the overall greenhouse effect. Trends in N_2O are shown in Figure 5.

Halocarbons The main concern with the family of man-made halocarbons has been their impact on the destruction of the stratospheric ozone layer. However they also act as greenhouse

gases. The restriction imposed by the Montreal Protocol show that for selected halocarbons there has been a decrease in their growth in the atmosphere (Figure 6).

Tropospheric Ozone Tropospheric ozone has just been recognized as a potentially important greenhouse gas. Because it varies both regionally and vertically, it is hard to assess its long-term global trend. Under the GAW programme, there is a great need to expand the measurement of this gas on a world-wide basis. A number of ozone vertical measurements have been proposed.

Use of the network

Recently a major effort has been to expand the GAW greenhouse gas network through the support of the Global Environment Facility (GEF). As project manager WMO, working closely with UNDP, has established six new GAW stations of global importance in Algeria, Argentina, Brazil, China, Kenya and Indonesia. These stations are already producing data or will shortly. Furthermore, a regional GEF project in South America which is managed by the WMO has been established to increase the measurement of ozone (Argentina, Brazil, Chile, Paraguay and Uruguay). These two projects have successfully demonstrated that some of the gaps in greenhouse gas measurements can be filled. However, similar projects are needed in other parts of the world, in particular in Africa and Asia.

Without WMO's coordinated greenhouse gas measurement programme, the potential problem of climate change due to the changing atmospheric composition would not have been recognized. With this recognition, climate modellers have used these data to predict climate change scenarios. This has been the key to the analysis under the activities of IPCC. Particularly, the WMO's GAW programme is considered the atmospheric chemistry contribution to the Global Climate Observation System (GCOS). Figure 7 shows a conceptional design of an operational framework of observations, analysis prediction and research underpinning climate services to society.

Global warming of the Earth-atmosphere system is being brought about by the greenhouse effect. The uncertainties in the predictions relating to the timing, magnitude and regional patterns of climate change are being addressed and here the WMO GAW greenhouse gas network is essential in providing the basic data used to resolve these uncertainties. These critical data are obtained from monitoring sites located in pristine regions of the world. Siting criteria is very specific from the standpoint of evaluating global trends. Only accurate monitoring over long periods of time can provide the data necessary to document trends and project potential of future pollution loads. Relating changes in climate, or other factors of the global environment, to concurrent trends in the background levels of greenhouse gases may permit forecasting of future changes. The low levels found in background conditions and the accuracy required to document small changes require continued scientific studies.

Infrastructure

WMO, through its earlier monitoring programmes and now GAW, has promulgated standardization of measurements by bringing interested scientists together at regular intervals. For example, to date five specialized conferences discussing methods of CO_2 observations and analysis have been sponsored by WMO (Bern 1981, Interlaken 1985, Hinterzarten 1989, Carqueiranne 1993 and Cairns 1997).

As an important function of GAW, the data obtained are archived at the WMO World Data Centre for Greenhouse Gases (WDCGG) established in Tokyo, Japan in 1990. There, systematic collection and distribution of data on the concentrations of greenhouse gases (CO_2, CH_4, CFCs, N_2O etc.) and the related gases (e.g. CO, NO_x , SO_2) are made. Further, the WMO has established three Quality Assurance Science Activity Centres in Germany, Japan and the United States where the quality of the GAW measurements are overseen on an international basis. For example, under this system the World Calibration Centre for Carbon Dioxide Measurements is at the NOAA laboratory in Boulder, USA.

Summary and future needs

To better predict climate change due to the greenhouse effect, there is a need to sample the atmosphere much more comprehensively, but still at reasonable cost. From the GAW monitoring perspective, the following needs can be outlined:

- The GAW system has been successful in establishing a world-wide network to measure greenhouse gases. However there are still many areas where there is an urgent need to expand these measurements if we are to understand the full implementations of climate change. GEF should consider this as a number one priority.

- The technical aspects of maintaining a sophisticated measurement programme require a strong infrastructure to ensure the consistent global quality. For example, though international calibration standards for carbon dioxide are in place, no such standards are available for the other greenhouse gases. This is one of the flaws in the GAW in ensuring a harmonized data set.

- A framework for the measurement of greenhouse gas concentrations is in place but to understand their sources and sinks requires measuring transport and flux in both the horizontal and vertical. Aircraft measurements play an important part in this where new automated techniques are now just being developed.

- Stronger ties between the modelling and measurement communities must be fostered. The upcoming meeting in Cairns, Australia (8-12 September 1997) will be the forum for such discussions.

There is no question that the accurate measurement of the concentrations and fluxes of greenhouse gases under the WMO's GAW programme is a basic activity in understanding and forecasting climate change.

Figure 1. The Global Atmosphere Watch Network

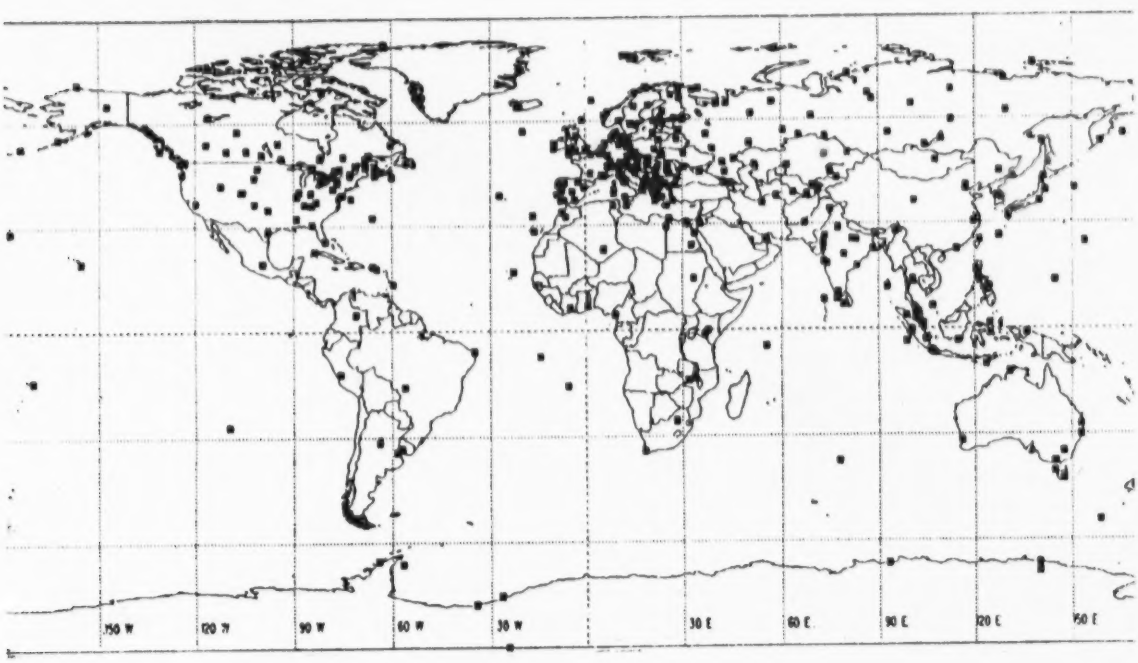


Figure 2. The long-term measurement of CO_2 concentration in Alaska, Hawaii, Samoa, and the South Pole

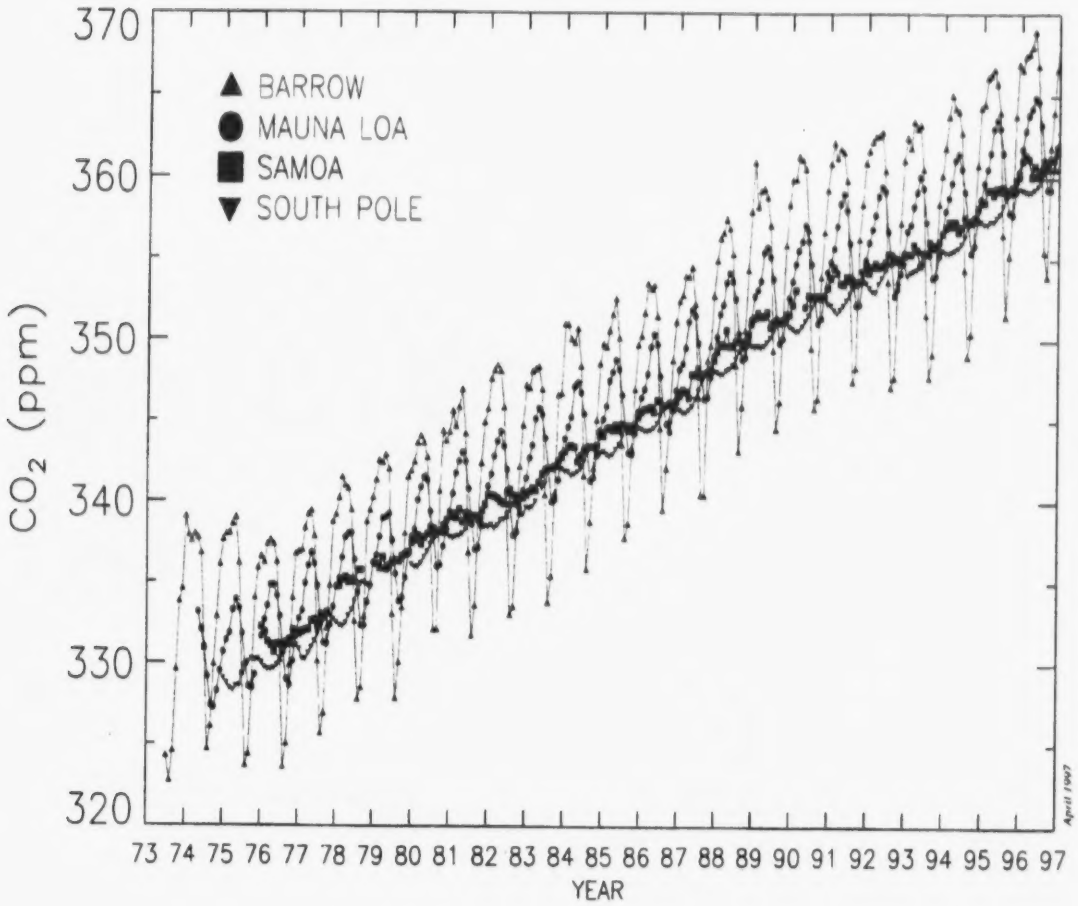
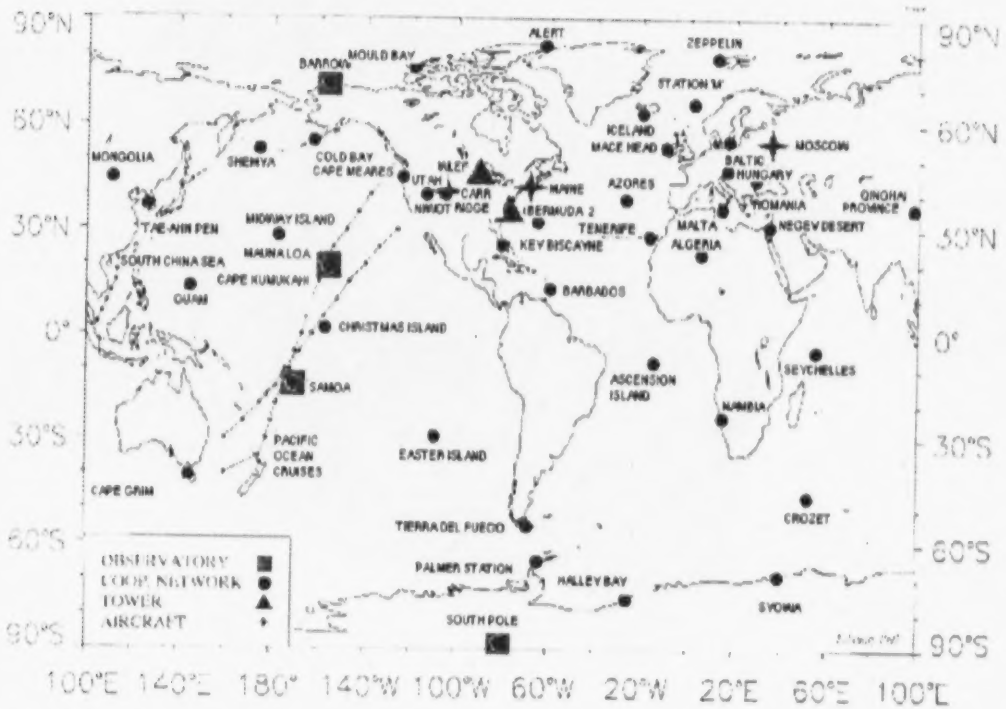


Figure 3. *The GAW network of CO_2 and other greenhouse gases around the world. Countries actively involved include: Australia, Canada, China, France, Germany, Hungary, Italy, Japan, Korea, New Zealand, Sweden and USA*



Figures 4. Global distribution of methane

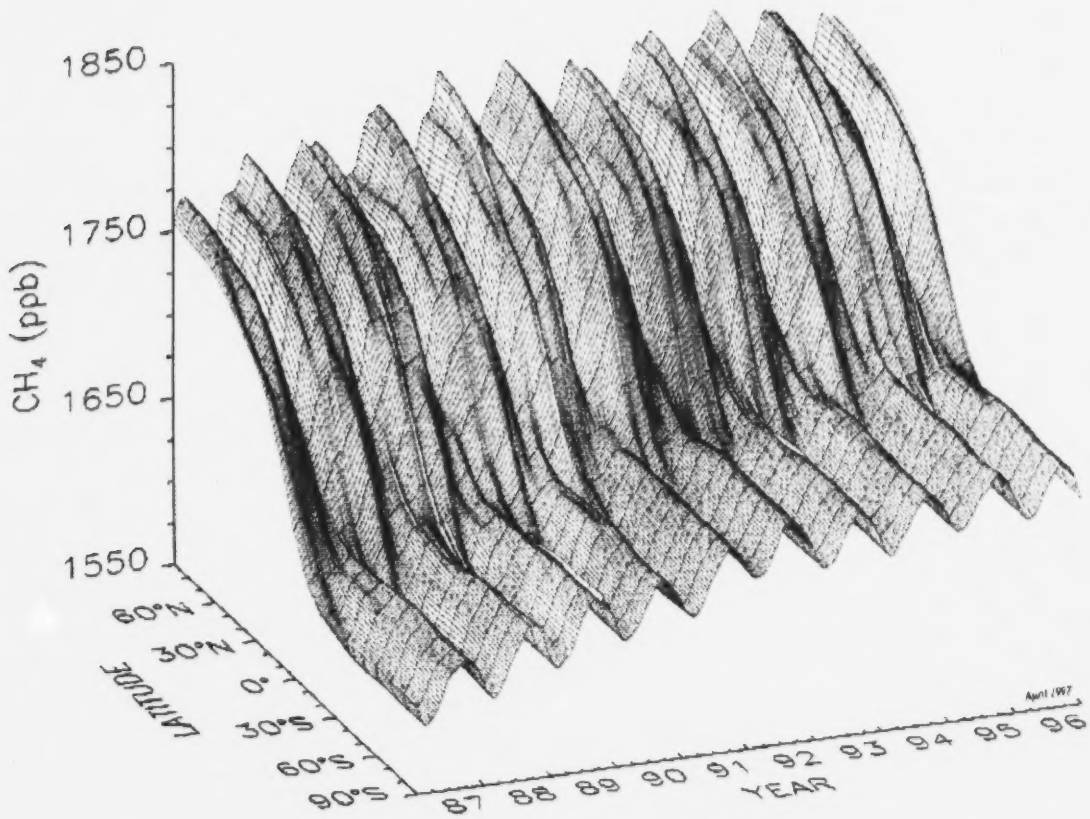


Figure 5. Monthly average N_2O concentrations at GAW global sites

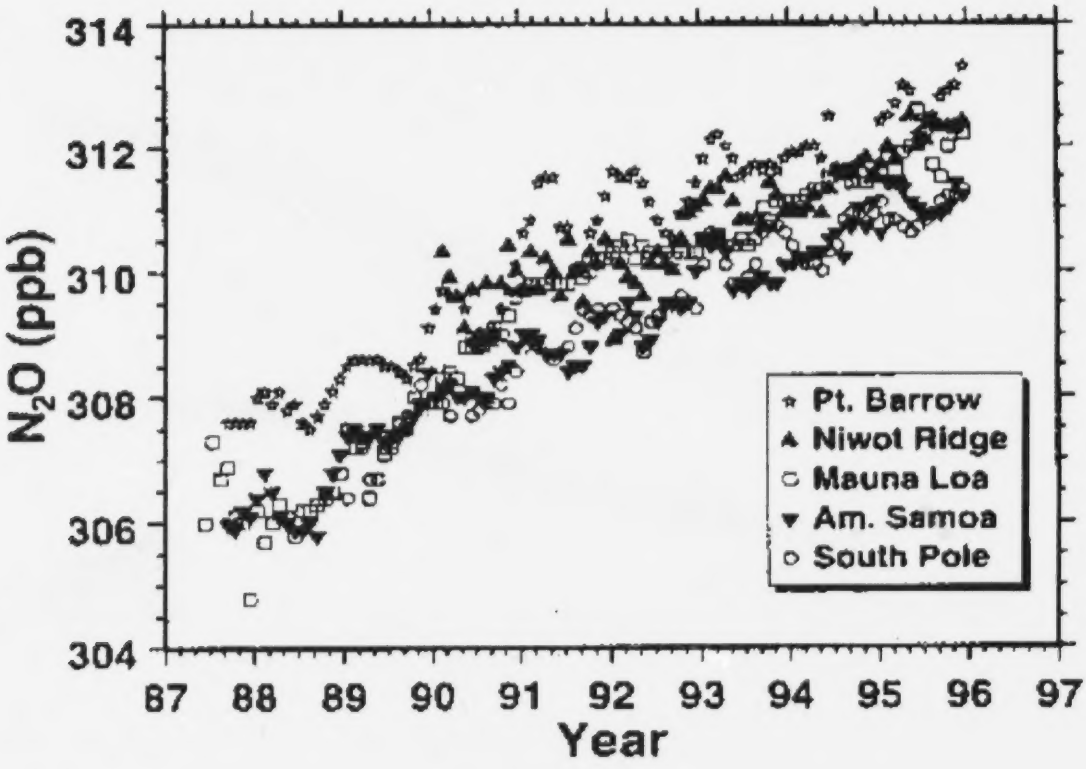


Figure 6. Concentrations of selected halocarbons at GAW global sites

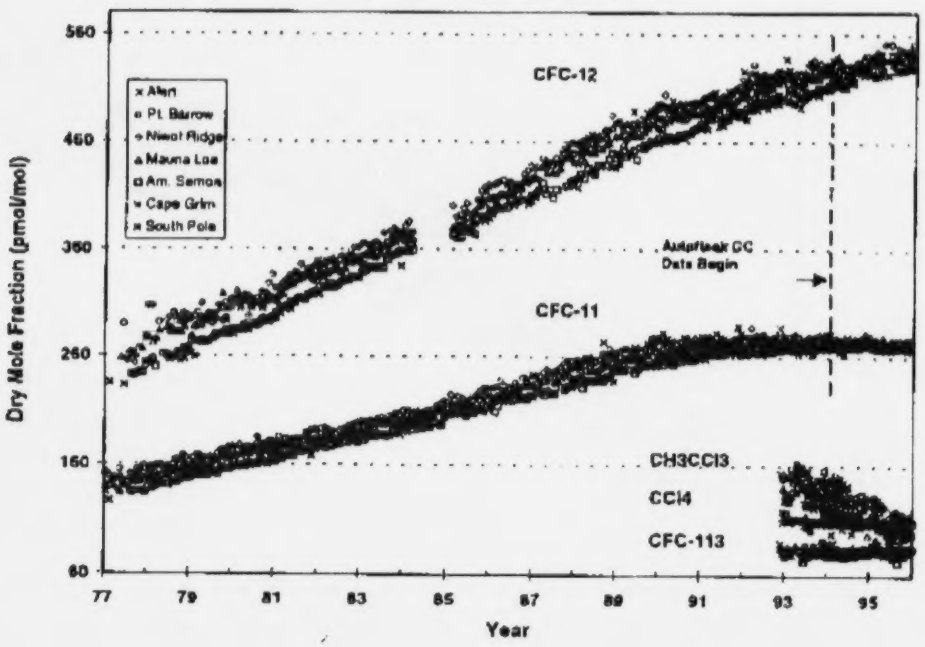


Figure 7. Operational framework of observations, analysis and research

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SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE
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Item 5 of the provisional agenda

METHODOLOGICAL ISSUES

Progress report

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GE.97-64263

I. INTRODUCTION

A. Mandate

1. At its fourth session, the Subsidiary Body for Scientific and Technological Advice (SBSTA) requested the secretariat to compile and synthesize information on emissions affected by weather and electricity trade, as well as the methodologies used for adjustments, from the national communications submitted by Parties and the in-depth reviews (FCCC/SBSTA/1996/20).

B. Scope of the note

2. This paper elaborates on the issue of adjustments to national greenhouse gas (GHG) inventories and projections, in particular to those related to temperature fluctuations. In preparing this paper, the secretariat compiled information on adjustments submitted by Parties in the first and second national communications; in total, seven Parties provided unadjusted and adjusted data on GHG emission inventories and/or projections. It also analysed the limitations of various methods and their implications. Detailed analyses may be found in technical paper TP/1997/2.1/

C. Background

3. The Conference of the Parties (COP), at its second session, decided that Parties included in Annex I to the Convention should use the revised guidelines for the preparation of their second national communications (FCCC/CP/1996/15/Add.1, decision 9/CP.2). The revised guidelines state that if Parties carry out any adjustments to inventory data, for example, due to climate variations or electricity trades, these adjustments should be reported in a transparent manner, with a clear indication of the method followed. At its fourth session, the SBSTA stressed the necessity of reporting inventories in mass units without adjustments, according to the guidelines. In relation to this, it concluded that adjustments are to be regarded as important information in relation to the monitoring of emission trends and the performance of policies and measures, and should be reported separately (FCCC/SBSTA/1997/4).

D. Possible action by the SBSTA

4. The SBSTA may wish to consider several approaches related to issues referred to in this note, such as:

1/Technical paper (TP/1997/2) was sent to experts for review and comments. The experts were nominated by governments. It was also sent to analysts from Annex I Parties, who co-operated with the secretariat by providing additional data and information.

(a) Taking no further action, and leaving it up to individual Parties for their own purposes to apply any adjustments, consistent with the guidelines from the COP; and/or

(b) Making recommendations to the COP, in co-operation with the Subsidiary Body for Implementation (SBI), for further guidelines regarding the reporting and use of adjusted emission data; and/or

(c) Advising the Ad Hoc Group on the Berlin Mandate (AGBM) and the SBI to consider the implications of adjustments for their own work; and/or

(d) Deferring the consideration of the issues to a future session and requesting Parties to submit comments on this subject.

II. ADJUSTMENTS

5. National emissions, in their development over time, usually show year-to-year variations in addition to a longer-term trend. For example, variations in winter temperatures influence fuel use for heating, and variations in summer temperatures influence energy demand for air-conditioning. Another example is the fluctuation in the amount of precipitation, which influences the availability of hydropower; this, in turn, may have an impact on the use of alternative energy sources for electricity production, such as coal. Yet another example is fluctuations in industrial production, which have consequences for energy use in production and transport.

6. Parties, in their analysis of emissions, may try to distinguish these short-term fluctuations from the longer-term developments. Indeed, in their projections of emissions over the period 1990-2000, some Parties have reported adjustments to their inventory for the base year, in order to reflect "normal" or "average" conditions, rather than the actual situation.

7. Separating the short-term fluctuations from the general trend has a number of potential applications. In general, it helps to develop a better understanding of the shorter and longer-term factors that determine the development of national emissions. This understanding then helps in the development of policies and measures, and in assessing their effects, or in making projections of future emissions. Furthermore, an undisturbed view of the general trend would be of relevance in view of the commitment in Article 4.2(a) of developed countries, to take the lead in modifying longer-term trends in anthropogenic emissions. At the same time, it would need to be clarified what adjustments, if any, would be appropriate in assessing progress towards reaching the quantitative aim in Article 4.2(b).

8. The fact that fluctuations occur as a result of external factors, including natural variability of weather and climate, does not mean that their related emissions are beyond control. For example, improving the thermal insulation of buildings and/or improving the

efficiency of heat supply may limit short-term fluctuations as well as longer-term emissions. Also, more efficient use of electricity from hydropower may limit the demand for electricity from other sources.

III. ADJUSTMENTS IN NATIONAL COMMUNICATIONS

9. Seven Parties submitted information on temperature adjustments to the secretariat (Table 1). The table indicates where information may be found in the national communications; the cause of the adjustments; the percentage change in total national CO_2 emissions due to adjustments (excluding land-use change and forestry) for the year 1990; the maximum adjustment in any year; and the percentage change in total national CO_2 emissions (excluding land-use change and forestry) between the years 1990 and 1995, both unadjusted and adjusted. The specific methods used by Parties are described in annex I.

10. Austria included, in its second national communication, a chapter on possible adjustments to the greenhouse gas inventory. A regression analysis revealed a statistically significant relation between fuel consumption and two parameters, namely, the heating degree day (HDD) index and an index of industrial production. Both adjustments are of the same order of magnitude.

11. The national communication from Belgium notes that, in order to "clearly define the objectives regarding CO_2 emissions, the problem of fluctuations due to temperature has to be solved". A temperature-adjusted base year (1990) was used in the projections; however, emission inventory data were not adjusted.

12. In Denmark, fluctuations in electricity trade, as driven by precipitation and water runoff in Scandinavia, lead to higher variations in emissions than fluctuations in temperature. If sufficient water is available, Denmark imports electricity produced from hydropower in other Scandinavian countries. In dry years, electricity is generated domestically by fossil fuel power plants. In the inventory chapter of its first national communication, Denmark reported that,
for 1990, electricity imports caused emissions to be 12% lower than if they had been produced by fossil fuel plants.

13. The emissions inventory of the second national communication from the Netherlands contains a separate column with the temperature-adjusted data. The calculation is facilitated by the fact that nearly 100% of the space heating is based on natural gas.

14. Sweden reported, in an appendix to its second national communication, additional temperature-and water runoff-adjusted inventory data. The electricity market of Sweden depends strongly on hydropower, and therefore on precipitation. Temperature and hydropower adjustments led to a maximum increase of emissions of +3.9% for the year 1990.

15. The projections in the second national communication of Switzerland are based on temperature-adjusted energy data using 1990 as a base year. The relation between the HDD index (see annex I) and fuel consumption for space heating was derived through simulations and empirical analyses.2/ Monthly corrections, instead of yearly corrections, led to greater accuracy. Other factors apart from temperature, such as wind, solar radiation and humidity, had no significant influence on the fuel consumption.

16. The United States of America noted, in the chapter on projections in its second national communication, that temperature adjustments for heating and cooling could raise or lower the emissions by plus or minus 20 million metric tons of carbon, or about ±1.5%.

Table 1: Summary of adjustments to CO_2 emissions and projections by Parties

Country	*Location in national communication*	*Cause for adjustment*	*Change in* CO_2 emissions due to adjustments for 1990	Maximum adjustment (year)	Change of unadjusted emissions (1990-95)	Change of adjusted emissions (1990-95)
Austria	Additional chapter - Second communication	Heating, industrial production index	+ 6% (temperature-adjusted)	+ 7% (1994) (temperature-adjusted)	+ 0.23%	- 3% (temperature-adjusted)
Belgium	Projections chapter - First communication	Heating	+ 3.9%	only value for 1990 provided	+ 6.1%	
Denmark	Inventory chapter - First communication	Hydropower	+ 12.0% (electricity-adjusted)	+ 12.0% (1990) (electricity-adjusted)	+ 21.3%	+ 1.4% (electricity-adjusted)
The Netherlands	Inventory chapter	Heating	+ 3.8%	+ 3.8% (1990)	+ 9.4%	+ 6.8%
Sweden	Appendix Second communication	Heating hydropower	+ 3.9% (incl. water runoff)	+ 3.9% (1990)	+ 4.8%	+ 1.1% (incl. water runoff)
Switzerland	Projections chapter - Second communication	Heating	+ 2.2%	only value for 1990 provided	- 3.9%	
The United States of America	Projections chapter - Second communication	Heating, cooling	+ 1.25%	***only value for 1990 provided***	**+ 5.0%**	

2/Bundesamt für Energiewirtschaft. "Klimanormierung Gebäudemodel Schweiz", Büro CUB, Juli 1995.

IV. DISCUSSION

17. Bearing in mind that adjusted data may currently be provided by Parties on an optional basis, Parties may, nevertheless, wish to consider whether there is a need to further elaborate on a common approach to applying the methods described in annex I. In so doing, Parties may wish to consider the possible uses of such methods. In this regard, at least four uses may be envisaged:

(a) To inform other Parties about the effects of temperature fluctuations and other specific influences on annual emissions, in addition to the general trend;

(b) As a basis for methodologies to assess the effects of policies and measures to mitigate emissions;

(c) To make projections of GHGs in a more consistent manner; and

(d) To assist in assessing the progress a Party is making regarding its commitments and aims.

18. With respect to the latter use (d), it may be noted that the technical paper TP/1997/2 also contains some calculations regarding averaging of yearly values of national emissions. Annex II and III summarize some results.

Explanatory notes

The following ISO country codes have been used:

Austria	AUT
Belgium	BEL
Canada	CAN
Czech Republic	CZE
Finland	FIN
France	FRA
Germany	DEU
Iceland	ISL
Ireland	IRL
Netherlands	NLD
New Zealand	NZL
Norway	NOR
Slovakia	SVK
Sweden	SWE
Switzerland	CHE
United Kingdom of Great Britain and Northern Ireland	GBR
United States of America	USA

Annex I

Methodologies used by Parties

Calculation of a temperature index

1. An essential step used by all Parties, when adjusting for temperature variations, is to calculate what is called a "heating degree day" (HDD) index.
It is defined as:

$$HDD = \sum_i (18°C - T_i)$$

2. Based on the above, an annual heating degree day value is arrived at by calculating the differences between a reference or base temperature (for example, 18°C) and the average temperature T_i for all the days i of one year, whose average temperature is below the base temperature. The reference temperature is based on the experience that heating will be operated if the temperature falls below a certain value, e.g. 18°C, as a daily average. The annual total of heating degree days is higher for cold years, and lower for warm years.

3. Some Parties, while using the above method for the winter period, employ a slightly different method, incorporating a threshold temperature, to calculate the HDD index for the spring and autumn. This method is slightly more accurate as it takes into account the increased use of space heating if the average outdoor temperature is below the base temperature but also allows for the fact that in the spring and autumn, space heating is applied at an average temperature considerably below the base temperature.

4. The HDD index is a common weather index used in all of the Parties. Nevertheless, base temperatures vary from 20°C in Switzerland to 17°C in Sweden. Threshold temperatures, where applied, range from 10°C to 15°C. In geographically large countries, the annual heating degree day values are aggregated to an average national value by weighting the values for different weather stations according to the surrounding population.

5. Variations in base and threshold temperatures lead to different absolute values and different relative fluctuations. Changing the base temperature of 20°C to 17°C changes the relative deviation from the average by about 20%.[1] Using different base and threshold temperatures can influence whether a year is below or above the average.

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[1] The influence of the choice of base temperature can be roughly estimated by assuming that heating is used for a period of 200 days a year. Changing the base temperature from 20°C to 17°C would decrease the total annual heating degree day value by around 200x(20-17). For German circumstances, this would be equivalent to changing the deviation from the average by about a fifth. For example, a year with an HDD index 8% higher than the average year calculated using a base temperature of 20°C, however, 10% above the average when using a base temperature of 17°C.

6. The implications of a greater use of air-conditioning in years with hot summers can be calculated by the same method, using cooling degree days instead of heating degree days. Thus, the annual total of cooling degree days (CDD) index is calculated by summing the differences of the average temperature T_i and a base temperature (for example, 18°C) for all days i of one year, whose average temperature is above the base temperature. However, the CDD index does not reflect the energy consumption by air-conditioning systems as accurately as the HDD index reflects the fuel consumption, because other meteorological variables, such as humidity, are closely related to the effectiveness of air-conditioning.

Approach A - Adjustment for space heating fuel

7. This approach applies adjustments for fuel used only for space heating. Fuel used for other purposes is unadjusted. The approach required data on fuel consumption for space heating from national energy statistics. A linear relationship is assumed between heating degree days and fuel consumption for space heating. For example, if the HDD index is 1% above the average, the fuel consumption used for space heating is also 1% above normal. This corresponds to an elasticity of 1 with respect to the fuel consumption for space heating. The base and threshold temperatures for calculating the heating degree days are chosen to best satisfy this relation. In some cases an elasticity of 0.5 to 0.7 is assumed, that is a 1% increase of the HDD index results in a 0.5% to 0.7% increase in emissions. The fuel consumption is then adjusted by the formula:

$$C_{norm} = C \cdot a \cdot \frac{1}{E \cdot \left(\frac{HDD}{HDD_{norm}} - 1 \right) + 1} + C \cdot (1 - a)$$

C:	uncorrected fuel consumption
C_{norm}:	corrected fuel consumption
HDD:	heating degree day index of the considered year
HDD_{norm}:	average heating degree day index over several years
E:	elasticity of fuel consumption used for space heating in relation to heating degree days (between 1 and 0.5)
a:	the proportion of total fuel consumption used for space heating (between 0 and 1)

8. To use this approach, data on the proportion of total fuel consumption used for space heating and the elasticity of consumption of those fuels with respect to the heating degree days, is needed.

Approach B - Regression analysis

9. This approach requires that the relationship between the HDD index and the total use of fuels be defined by regression analysis of fuel data. If factors in addition to temperature are influencing the emissions, a multiple regression for the heating degree day index and

other relevant factors is undertaken. The output of the regression analysis is a relationship describing the uncorrected fuel consumption as a function of the HDD index and the other relevant parameters. A simple example for such a relation with the gross domestic product (GDP) as an additional parameter would be the following:

$$C = a \cdot HDD + b \cdot GDP + \ldots$$

C:	uncorrected fuel consumption
HDD:	heating degree days index of the considered year
GDP:	gross domestic product of the considered year
a,b:	constants determined by the analysis

10. The equation can be used to estimate the adjusted fuel consumption using the average value of the HDD day index instead of the actual value.

$$C_{norm} = a \cdot HDD_{norm} + b \cdot GDP + \ldots$$

C_{norm}:	corrected fuel consumption of the considered year
HDD_{norm}:	average heating degree day index over several years

11. This approach requires energy and economic data sufficient to perform a statistically significant regression.

Applications

12. The first method, that is, the heating degree day method with fuel used for space heating may be used to adjust annual emission inventories and projections of future emissions, provided that economic models supply the data. However, historical and/or modelling data on fuel used for space heating may not be available in some countries. This approach supports all four uses listed on page 6 and may have the additional advantage of reflecting the effectiveness of policies directed at the space heating sector.

13. The second method, that is, the use of regression analysis, has the advantage of being able to accommodate other factors that influence emissions, such as precipitation and economic variables, *inter alia*, gross domestic product or industrial production. It requires considerable amount of historical data and more complex analysis. As such, it may provide more comprehensive information about emissions fluctuations. It has its limitations for projections where the fluctuations are inherently high, such as those associated with rainfall. It could be used to assist in assessing the progress a Party is making regarding its commitments.

14. A simple alternative to the above methods would be averaging emissions over a number of years. It requires no additional data other than that which is required to report annual emissions. A disadvantage is that progress towards reaching an aim cannot be determined until one or more years after a target year, although this may not be the case for a budget. The method of averaging, as discussed in TP/1997/2, may be considered as a tool

in assessing compliance. An example of the effect of averaging emissions is shown in annex II and III.

Annex II

Percentage change in CO_2 emissions based on a five-year average and single year

Country	CO_2 emissions 1990 [Gg]	Average CO_2 emissions (1991-95) [Gg]	CO_2 emissions 1995 [Gg]	Percentage change in emissions between 1990 and average 1991-95 / -1 in %	Percentage change in emissions (1990-95) / -1 in %
AUT	61880	61516	62020	-0.6	0.2
BEL	116090	N.A.[2]	N.A.	N.A.	N.A.
CAN	464000	474505	499526	2.3	7.7
CHE	45070	44712	44170	-0.8	-2.0
CZE	165490	136955	128817	-17.2	-22.1
DEU	1014155	923822	894500	-8.9	-11.8
FIN	53800	N.A.	56050	N.A.	4.2
FRA	378379	387193	385347	2.3	1.8
GBR	583747	562927	543338	-3.6	-6.9
ISL	2147	2223	2282	3.5	6.3
IRL	30719	32642	33931	6.3	10.5
NLD	167550	176140	183400	5.1	9.5
NOR	35544	35969	37880	1.2	6.6
NZL	25476	27186	27367	6.7	7.4
SVK	60032	47973	48516	-20.1	-19.2
SWE	55445	56762	58108	2.4	4.8
USA	4965510	5073336	5214710	2.2	5.0

[2] N.A. : non-available.

Annex III

Percentage change in CO_2 emissions based on a three-year average baseline and target

Country	Average CO_2 emissions (1990-92) [Gg]	Average CO_2 emissions (1993-95) [Gg]	Percentage change in emissions between average 1990-92 and average 1993-95 (in %)
AUT	62887	60267	-4.2
BEL	117855	N.A.	N.A.
CAN	462000	483509	4.7
CHE	45717	43827	-4.1
CZE	152951	130471	-14.7
DEU	971988	905767	-6.8
FIN	N.A.	56137	N.A.
FRA	393635	377812	-4.0
GBR	581734	551061	-5.3
ISL	2138	2283	6.8
IRL	31578	33064	4.7
NLD	171250	178167	4.0
NOR	34611	37185	7.4
NZL	26479	27323	3.2
SVK	53837	46128	-14.3
SWE	55548	57536	3.6
USA	4949607	5161123	4.3

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